

Constraint-Checking Editor for Procedure Tracking (ConCEPT), Phase II

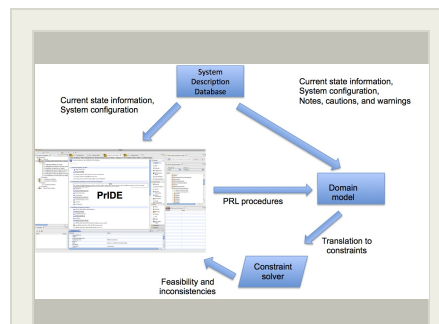
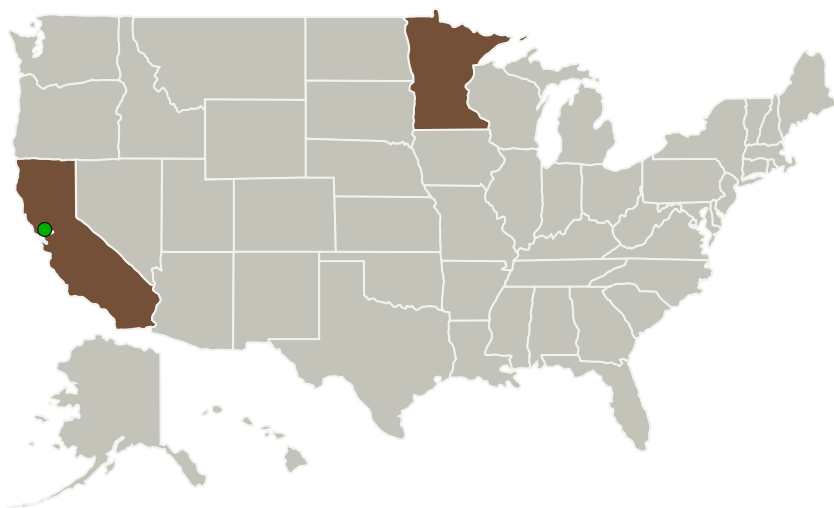
Completed Technology Project (2014 - 2016)



Project Introduction

Constructing, maintaining, and adapting operational procedures for manned space operations is a complex task, requiring the procedure author to satisfy constraints resulting from the system configuration, current state, and a set of procedural constraints imposing additional restrictions on these procedures. For operations on NASA's International Space Station (ISS), these procedural constraints may be of several different types. Notes, Cautions, Warnings, and Inhibits are all relevant types of procedural constraints. Phase I of the Constraint-Checking Editor for Procedure Tracking (ConCEPT) established the feasibility of constructing a constraint-checking system for procedures represented in the Procedure Representation Language (PRL). Using automated translation and Constraint Satisfaction Problem (CSP) generation technologies developed on previous projects, ConCEPT assists users in identifying conflicts and inconsistencies in PRL procedures as they are developed. The user edits a PRL procedure in the Procedure Integrated Development Environment (PrIDE), using procedure steps that have been annotated with procedural constraints. As the procedure is being developed, ConCEPT automatically and continuously gathers appropriate procedural constraints and checks them against the procedure. ConCEPT then alerts the user to any violated constraints. Phase I defined relevant scenarios of use and established feasibility by demonstrating a proof-of-concept system to relevant NASA flight controllers.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Adventium Enterprises, LLC	Lead Organization	Industry	Minneapolis, Minnesota
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations

California	Minnesota
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Project Transitions

▶ **April 2014:** Project Start

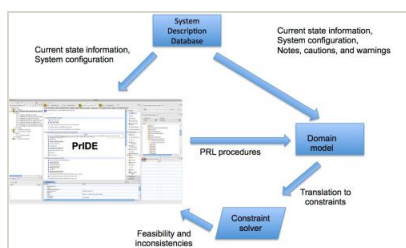
✓ **April 2016:** Closed out

Closeout Summary: Constraint-Checking Editor for Procedure Tracking (ConCEPT), Phase II Project Image

Closeout Documentation:

- Final Summary Chart Image(<https://techport.nasa.gov/file/137633>)

Images



Briefing Chart Image

Constraint-Checking Editor for Procedure Tracking (ConCEPT), Phase II

(<https://techport.nasa.gov/image/126070>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Adventium Enterprises, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Mark Boddy

Co-Investigator:

Mark S Boddy

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Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX10 Autonomous Systems
 - └ TX10.2 Reasoning and Acting
 - └ TX10.2.2 Activity and Resource Planning and Scheduling

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System